Permit Fact Sheet

General Information

Permit Number:	WI-0025020-10-0	
Permittee Name:	VILLAGE OF OSCEOLA	
Address:	Box 217 310 Chieftain Street	
City/State/Zip:	OSCEOLA WI 54020-0217	
Discharge Location:	103 Depot Road, Osceola, Wisconsin (NE¼ SE¼ Section 28; T33N-R19W)	
Receiving Water:	The St. Croix River within the Trout Brook Watershed in the St. Croix River Drainage Basin in Polk County.	
StreamFlow ($Q_{7,10}$):	1,100 cfs	
Stream Classification:	Fish and aquatic life, warm water sport fish, exceptional resource water.	
Wild Rice Impacts:	No impacts identified. It is assumed that there is wild rice on the St. Croix in Polk County, but surveys have not been conducted. • The waste meets NR 105.04 Wis. Adm. Code • The wastewater permit has been in existence over a long period • The discharge volume compared to river flow is small	
Design Flow(s)	Daily Maximum	1.06 MGD (2004 Facility Plan)
	Annual Average	0.606 MGD (2004 Facility Plan)
Significant Industrial Loading?	There are no Categorical or Significant Industrial users identified, but Invest Cast Inc. (Bealka Castings), Northwire, RaTech Manufacturing, American Bronze Casting and Surpass are contributing industries.	
Operator at Proper Grade?	Yes	
Approved Pretreatment Program?	N/A, The DNR has pretreatment program authority for Invest Cast, Inc. (Bealka Castings).	

Facility Description

The Village of Osceola owns and operates a domestic wastewater treatment system that serves the communities of Osceola and Dresser. The plant designed to treat 606,000 gallons per day currently treats an average of 299,000 gallons per day (July 2014 – July 2019).

The facility is an activated sludge plant which utilizes an extended aeration period. Primary treatment consists of headworks (fine screens and grit separators) that remove debris, chemical addition, an oxidation ditch, clarifiers and disinfection. More specifically, the activated sludge process is composed of settled solids containing naturally occurring microorganisms recycled from the treatment system. Following the headworks ferric chloride is added to the wastewater to precipitate phosphorus. The wastewater then enters the oxidation ditch (air added) where the microorganisms break down the organic matter. The water is then pumped into final clarifiers where the remaining solids including phosphorus is settled out. The treated wastewater (effluent) is disinfected seasonally (April through October) using an Ultra-Violet light system and discharged to the St. Croix River.

Settled solids (sludge) is removed from the clarifiers; some is returned to the oxidation ditch to re-seed the new wastewater entering the system. The sludge that is not used as activated sludge is treated by bacteria and organisms through aerobic digestion; reducing harmful pathogens and hauled to the West Central Wisconsin Biosolids Facility at Ellsworth for further treatment. Centrate (wastewater generated from dewatering sludge) from the West Central Wisconsin Biosolids facility is accepted at a receiving tank in Dresser and returned to the Osceola wastewater treatment facility.

Sample Point Designation		
Sample Point Number	**Discharge Flow, Units, and Averaging Period**	**Sample Point Location, WasteType/sample Contents and Treatment Description (as applicable)**
701	INFLUENT An average of 0.299 MGD (July 2014 – July 2019 data)	Representative samples shall be collected in the Parshall flume after the bar screen.
001	EFFLUENT An average of 0.266 MGD (July 2014 – July 2019 data)	Representative samples shall be collected prior to the disinfection unit for BOD, total suspended solids, pH, chlorides, and phosphorus and immediately following the disinfection unit for fecal coliform.
002	SLUDGE An annual average of 120 tons is sent to the WCWBF. Sludge is not landspread by the facility.	Sludge samples shall be collected prior to hauling to the West Central Wisconsin Biosolids Facility at Ellsworth or other facility. Test results shall be reported on Form 3400-49 'Waste Characteristics Report'. Hauled sludge reports shall be submitted on Form 3400-52 'Other Methods of Disposal or Distribution Report' following each year sludge is hauled.

Substantial Compliance Determination

	Compliance?	Comments	
Discharge limits	Yes		
Sampling/testing requirements	Yes		
Groundwater standards	N/A		
Reporting requirements	Yes		
Compliance schedules	Yes		
Management plan			
Operator at proper grade	Yes	Operator will have this permit term to complete the Sanitary Sewage Collection system subclass.	
Other	Current plant subclasses: A1. Suspended Growth Processes (Activated Sludge), B. Solids Separation (Clarifiers, membranes, filters, etc); C. Sludge Treatment (Aerobic /anaerobic digestion, thickening, dewatering, land application); P. Total Phosphorus Removal; D. Disinfection; SS. Sanitary Sewage Collection System		
Enforcement considerations			
In substantial compliance?	Yes		
	Concurrence: Jordan J. Englebert		Date: 7/9/2019

1 Influent - Proposed Monitoring

Sample Point Number: 701- INFLUENT

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	
BOD5, Total		mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total		mg/L	3/Week	24-Hr Flow Prop Comp	

Changes from Previous Permit & Explanation of Limits and Monitoring Requirements:

No changes from the previous permit. The parameters are standard monitoring requirements and frequency for minor municipal facilities with a biological treatment plant. Tracking of BOD5, and Suspended Solids are required for percent removal requirements found in s. NR 210.05, Wis. Adm.

2 Surface Water - Proposed Monitoring and Limitations

Sample Point Number: 001- EFFLUENT

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	
BOD5, Total	Monthly Avg	30 mg/L	3/Week	24-Hr Flow Prop Comp	
BOD5, Total	Weekly Avg	45 mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Monthly Avg	30 mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Weekly Avg	45 mg/L	3/Week	24-Hr Flow Prop Comp	
pH Field	Daily Max	9.0 su	3/Week	Grab	
pH Field	Daily Min	6.0 su	3/Week	Grab	
Phosphorus, Total	Monthly Avg	1.0 mg/L	3/Week	24-Hr Flow Prop Comp	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Phosphorus, Total	Monthly Avg	9.2 lbs/day	3/Week	Calculated	See the "Lake St. Croix TMDL Phosphorus Allocation" subsection for more information.
Phosphorus, Total		lbs/yr	Monthly	Calculated	See the "Lake St. Croix TMDL Phosphorus Allocation" subsection for more information.
Fecal Coliform	Geometric Mean - Monthly	400 #/100 ml	Weekly	Grab	Limit and monitoring effective April 15th through October 15th.
Fecal Coliform	Geometric Mean - Wkly	656 #/100 ml	Weekly	Grab	Limit and monitoring effective April 15th through October 15th.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	108 mg/L	Monthly	24-Hr Flow Prop Comp	Monitoring and limit are in effect November through April.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	108 mg/L	Monthly	24-Hr Flow Prop Comp	Monitoring and limit are in effect November through April.
Nitrogen, Ammonia (NH3-N) Total		mg/L	Monthly	24-Hr Flow Prop Comp	Monitoring May through October is required in 2022.
Nitrogen, Ammonia (NH3-N) Total	Daily Max - Variable	mg/L	Monthly	24-Hr Flow Prop Comp	Monitoring and variable limits are in effect November through April. See the "Ammonia Limitation" subsection.
Nitrogen, Ammonia Variable Limit		mg/L	Monthly	24-Hr Flow Prop Comp	Monitoring and variable limits are in effect November through April. See the "Ammonia Limitation" subsection.
Hardness, Total as CaCO3		mg/L	Monthly	24-Hr Flow Prop Comp	Monitoring is required during 2022.
Copper, Total Recoverable		mg/L	Monthly	24-Hr Flow Prop Comp	Monitoring is required during 2022.
Chloride		mg/L	Monthly	Grab	Monitoring is required during 2022.

Changes from Previous Permit & Explanation of Limits and Monitoring Requirements:

The monitoring frequency and limits for **Flow**, **BOD5**, **Suspended Solids** and **pH** have not changed from the previous permit term. All categorical limits are based on NR 104.02 and NR 210 (Subchapter II) Wis. Adm. Code. More information on calculating limits for these parameters as well as **Ammonia**, **Phosphorus**, **Temperature**, **Disinfection,** and **WET Testing** can be found in the "Water Quality-Based Effluent Limitations for the Village of Osceola (WI-0025020)" memo dated August 6, 2019.

BOD and Total Suspended Solids - Categorical limits for BOD and TSS are required per NR 104 and 210.05, Wis. Adm. Code.

pH – Categorical limits for pH are required per ch. NR 210 (Subchapter II).

Phosphorus – Phosphorus requirements are based on the Phosphorus Rules that became effective 12/1/2010 as detailed in NR 102 Water Quality Standards and NR 217 Effluent Standards and Limitations for Phosphorus. Chapter NR 217 of the Wis. Adm. Code addresses point source dischargers of phosphorus to surface waters. Currently in NR 217 Wis. Adm. Code there are three methods applicable to this facility that are used to determine if a phosphorus limit is needed: a technology based effluent limit (TBEL) and a water quality based effluent limit (WQBEL) determined by stream criteria and a WQBEL based on a Total Maximum Daily Load (TMDL).

In the case of the Village of Osceola:

- A TBEL of 1 mg/L is needed if a facility discharges more than the threshold of 150 pounds per month (NR 217.04(1)(a)1 Wis. Adm. Code). The facility discharges less than the threshold (approximately 22 lbs/month), but a limit of 1 mg/L has been a requirement at the facility over a number of permit terms. Based on anti-backsliding rules (NR 207 Wis. Adm. Code) the limitation will remain in effect this permit term.
- Based on the size and classification of the stream, the water quality criteria for the St. Croix River is 100 ug/L. In this case, the WQBEL is 85 mg/L (monthly average). The WQBEL is not required this permit term because the TBEL and TMDLWLAs (explained in the next bullet) are protective of the immediate receiving water.
- The facility lies within the boundaries of the Lake St. Croix Total Maximum Daily Load (TMDL). The TMDL was developed for the St. Croix River to address phosphorus water quality impairments. The Lake St. Croix TMDL for Total Phosphorus was approved by the U.S. Environmental Protection Agency on August 8, 2012. More information about the TMDL can be found at https://dnr.wi.gov/water/tmdlDetail.aspx?key=58856580.

  Based on current criteria, the approved TMDL Waste Load Allocation (WLA) for Total Phosphorus is 2,282 lbs per year, which equates to **9.2 lbs/day monthly average**.

  Calculation and reporting of the total mass of phosphorus discharged over the past 12 months is required to track progress in meeting the WLA and overall TMDL point source reductions is also included. The 12-month rolling sum equals the sum of the most recent 12 consecutive months of total monthly discharges. This value should be reported on the eDMR on the last day of each month.

  Calculations needed to determine compliance with the wasteload allocation are:

  - **Total Daily Discharge (lbs/day)** = Daily concentration (mg/L) x total flow for the day (MG) x 8.34.
  - **Total Monthly Discharge (lbs/month)** = monthly average concentration (mg/L) x total flow for the month (MG/month) x 8.34.
  - **12-Month Rolling Sum of Total Monthly Discharge** = the sum of the most recent 12 consecutive months of total monthly discharges.

Fecal Coliform – Disinfection requirements and categorical limits for fecal coliform can be found in NR 210.06 Wis. Adm. Code. Regulatory changes to s. NR 205.065, Wis. Adm. Code, became effective September 1, 2016. The rule requires limits in this permit to be expressed as weekly average and monthly average limits whenever practicable. These changes are based on 40 CFR 122.45(d). In order to comply with this regulation, a weekly geometric mean limit of 656 #/100 has been included.

Ammonia – Using current acute and chronic ammonia toxicity criteria found in Tables 2C and 4B of NR 105 Wis. Adm. Code (effective March 1, 2004) and limit calculating procedures (Subchapter IV of 106, Wis. Adm. Code (update effective September 1, 2016). Ammonia limitations were calculated for the facility. Daily maximum limits expressed as a variable limit are required. Sample results for pH shall be used to calculate the variable limit (see the Maximum Effluent Ammonia Concentration Limits table at the end of this section). Limits are in effect November through April. When possible total ammonia (NH3-N) sampling shall occur on the same day pH levels are monitored. Report the applicable variable limit on the Discharge Monitoring Report (DMR) in the Ammonia Variable Limit column.

Weekly Average limits (108 mg/L (November-April) and Monthly Average (108 mg/L (November-April) limits were considered (consistent with the highest allowable daily limit found in the Variable Limits Table). There is not a reasonable potential for the Weekly or Monthly Average limits to be exceeded. But regulatory changes to s. NR 205.065, Wis. Adm. Code, became effective September 1, 2016. The rule requires limits in this permit to be expressed as weekly average and monthly average limits whenever practicable. These changes are based on 40 CFR 122.45(d). In order to comply with this regulation, Weekly and Monthly Average limits have been included.

Variable Limits Table

Daily maximum ammonia limits based on Effluent pH

Effluent pH (s.u.)	**NH_3-N Limit** (mg/L)	**Effluent pH** (s.u.)	**NH_3-N Limit** (mg/L)	**Effluent pH** (s.u.)	**NH_3-N Limit** (mg/L)
$6.0 < pH \leq 6.1$	108	$7.0 < pH \leq 7.1$	66	$8.0 < pH \leq 8.1$	14
$6.1 < pH \leq 6.2$	106	$7.1 < pH \leq 7.2$	59	$8.1 < pH \leq 8.2$	11
$6.2 < pH \leq 6.3$	104	$7.2 < pH \leq 7.3$	52	$8.2 < pH \leq 8.3$	9.4
$6.3 < pH \leq 6.4$	101	$7.3 < pH \leq 7.4$	46	$8.3 < pH \leq 8.4$	7.8
$6.4 < pH \leq 6.5$	98	$7.4 < pH \leq 7.5$	40	$8.4 < pH \leq 8.5$	6.4
$6.5 < pH \leq 6.6$	94	$7.5 < pH \leq 7.6$	34	$8.5 < pH \leq 8.6$	5.3
$6.6 < pH \leq 6.7$	89	$7.6 < pH \leq 7.7$	29	$8.6 < pH \leq 8.7$	4.4
$6.7 < pH \leq 6.8$	84	$7.7 < pH \leq 7.8$	24	$8.7 < pH \leq 8.8$	3.7
$6.8 < pH \leq 6.9$	78	$7.8 < pH \leq 7.9$	20	$8.8 < pH \leq 8.9$	3.1
$6.9 < pH \leq 7.0$	72	$7.9 < pH \leq 8.0$	17	$8.9 < pH \leq 9.0$	2.6

Chloride, Hardness and **Copper** – A review of data showed there isn't reasonable potential for chloride or copper levels to exceed the calculated limits. Monthly monitoring is required during the 2022 calendar year to provide enough data to determine if a limit is needed during the next permit reissuance.

Thermal – Using the administrative rules for thermal discharges detailed in NR 102 Subchapter II Water Quality Standards for Temperature and NR 106 Subchapter V Effluent Limitations for Temperature effective October 2010, effluent thermal limits were calculated. The calculated thermal limits for the St Croix River indicate a daily temperature limit of 120 degrees F. Effluent temperatures from activated sludge systems have not reported temperatures above 73 degrees and are not expected to reach this level, therefore, monitoring and limits are not required this permit term.

WET Testing - As the toxicity potential increases, Whole Effluent Toxicity Testing is required to assure toxicity is not occurring over the short (acute) and long (chronic) term. Chronic WET tests are not required when the ratio of receiving water flow to effluent flow exceeds 100:1 and Acute WET tests are not required if the ratio exceeds 1000:1. The ratio for this facility is approximately 1171:1; therefore, no acute or chronic WET tests are required this permit term.

3 Land Application - Proposed Monitoring and Limitations

Municipal Sludge Description						
Sample Point	**Sludge Class (A or B)**	**Sludge Type (Liquid or Cake)**	**Pathogen Reduction Method**	**Vector Attraction Method**	**Reuse Option**	**Amount Reused/Disposed (Dry Tons/Year)**
002	B	Liquid	N/A	N/A	Hauling to West Central Wisconsin Biosolids Facility	120 dry tons/yr
Does sludge management demonstrate compliance? Yes						
Is additional sludge storage required? Not as long as sludge continues to be hauled to another permitted facility.						
Is Radium-226 present in the water supply at a level greater than 2 pCi/liter? No, According to the last sample taken in 2019 the radium-226 level was 1.4 pCi/liter. If yes, special monitoring and recycling conditions will be included in the permit to track any potential problems in landapplying sludge from this facility						
Is a priority pollutant scan required? No Priority pollutant scans are required once every 10 years at facilities with design flows between 5 MGD and 40 MGD, and once every 5 years if design flow is greater than 40 MGD.						

Sample Point Number: 002- HAULED SLUDGE

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Solids, Total		Percent	Annual	Composite	
Arsenic Dry Wt	Ceiling	75 mg/kg	Annual	Composite	
Arsenic Dry Wt	High Quality	41 mg/kg	Annual	Composite	
Cadmium Dry Wt	Ceiling	85 mg/kg	Annual	Composite	
Cadmium Dry Wt	High Quality	39 mg/kg	Annual	Composite	
Copper Dry Wt	Ceiling	4,300 mg/kg	Annual	Composite	
Copper Dry Wt	High Quality	1,500 mg/kg	Annual	Composite	
Lead Dry Wt	Ceiling	840 mg/kg	Annual	Composite	
Lead Dry Wt	High Quality	300 mg/kg	Annual	Composite	
Mercury Dry Wt	Ceiling	57 mg/kg	Annual	Composite	
Mercury Dry Wt	High Quality	17 mg/kg	Annual	Composite	
Molybdenum Dry Wt	Ceiling	75 mg/kg	Annual	Composite	
Nickel Dry Wt	Ceiling	420 mg/kg	Annual	Composite	
Nickel Dry Wt	High Quality	420 mg/kg	Annual	Composite	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Selenium Dry Wt	Ceiling	100 mg/kg	Annual	Composite	
Selenium Dry Wt	High Quality	100 mg/kg	Annual	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	Annual	Composite	
Zinc Dry Wt	High Quality	2,800 mg/kg	Annual	Composite	
Nitrogen, Total Kjeldahl		Percent	Annual	Composite	
Nitrogen, Ammonium (NH4-N) Total		Percent	Annual	Composite	
Phosphorus, Total		Percent	Annual	Composite	
Phosphorus, Water Extractable		% of Tot P	Annual	Composite	
Potassium, Total Recoverable		Percent	Annual	Composite	
PCB Total Dry Wt	Ceiling	50 mg/kg	Once	Composite	Monitoring is required in 2021.
PCB Total Dry Wt	High Quality	10 mg/kg	Once	Composite	Monitoring is required in 2021.

Changes from Previous Permit & Explanation of Limits and Monitoring Requirements:

The requirements for land application of municipal sludge are determined in accordance with ch. NR 204 Wis. Adm. Code. The facility transports all sludge to the West Central Wisconsin Biosolids Facility (WCWBF) located in Ellsworth Wisconsin. The WCWBF, regulated by WPDES permit #0058726, combines and treats sludge from 20 facilities producing a Class A biosolids product. The most recent radium-226 sample (2019) taken by the Osceola waterworks was 1.4 pCi/liter. Normally, if the sample was above the 2 pCi/liter threshold, additional sampling and restrictions for landspreading is required. But it has been determined the multiple community contributions to WCWBF dilute the sludge from a facility so that the final biosolid product is under the threshold. As part of contract with WCWBF the Village of Osceola is required to monitor for metals and notify them of radium samples when taken.

Water Extractable Phosphorus - Water extractable phosphorus (WEP) is the coefficient for determining plant available phosphorus from measured total phosphorus. In Wisconsin, the Penn State Method is utilized and is expressed in percent. While a total P may be significant, the WEP may show that only a small percentage of the P is available to plants because of factors such as treatment processes and chemical addition that "tie-up" phosphorus limiting the amount of phosphorus that is plant available. As part of the Wisconsin's nutrient management plan (NMP) requirements, the accounting of all fertilizers must be included over the NMP cycle. The fertilizer value of the waste needs to be communicated to the farmer and accounted for in the NMP.

4 Compliance Schedules

Explanation of Compliance Schedules

No schedules are required this permit term,

Attachments:

Water Flow Schematic(s)
"Water Quality-Based Effluent Limitations for the Village of Osceola (WI-0025020)" memo dated August 6, 2019

Proposed Expiration Date:

December 31, 2024

Justification Of Any Waivers From Permit Application Requirements

N/A

Prepared By:

Sheri A. Snowbank Wastewater Specialist

Date: September 4, 2019

cc: Jordan Englebert